

GARDEX



*Armored Cables
for Hazardous Locations*



Dekoron Wire & Cable is one of the most reputable industrial cable manufacturers in the world. Manufactured in the United States of America with rigorous attention to detail and quality standards, Dekoron's products are specified by many industry leaders for some of the most challenging projects. As part of the Marmon Group and Berkshire Hathaway, Dekoron has the financial backing, technical support, and resource sharing of other Marmon Wire & Cable companies, giving Dekoron an advantage when dealing with even the most complex requirements. Dekoron's core strengths include the ability to design cables to meet the stringent requirements of our customers, fast delivery to meet on-site needs, and the capability to meet various regulatory standards.

Gardex®

Marmon Gardex® Type MC-HL and ITC-HL continuously-corrugated, welded armor cables have been developed and improved over the last 50 years. Dekoron specializes in MC-HL, ITC-HL, and Fieldbus cables, as well as custom cables that use category communication cable or optical fibers as core material.

Gardex® is a self-contained cable conduit system with an impervious continuously-corrugated armor. This armor provides a vapor-tight, metallic sheath to protect the cable. An overall polymeric jacket and an equipment grounding conductor(s) are also provided to meet hazardous location (“-HL”) requirements.

Gardex® Type MC-HL and ITC-HL cables are listed for use in Class I, Division 1 hazardous locations. A Class I, Division 1 location is defined as an area where ignitable concentrations of flammable gases or vapors are present in normal operating conditions. The Gardex® armor system is recognized as two of the four approved wiring methods in NEC Article 501.10.A.1.

Gardex® cables are also suitable for Class I, Division 2 applications.

Gardex® Armored Cables for Hazardous Locations

- Self-Contained Conduit and Wiring System
- Provides a Hermetically Sealed Barrier
- Electrostatic shield when grounded properly
- Provides Ruggedness and Physical Protection for Cables against Workplace and Installation Hazards
- Armor is Impact and Crush Resistant to UL 2225 Standards
- Aluminum Sheath Provides Superior Electrical Shielding Performance for AC Drive Applications
- Outer Jackets are Sunlight, Oil, and Moisture Resistant
- Oil Resistant II or ARCTIC-GRADE (-40°C) Jackets are available
- All Jackets have Printed Sequential Length Markings (Feet or Meter)



Instrumentation and Control Cables, configurations and options:

Instrumentation:

300V, 105°C, UL Type PLTC/ITC & ITC-HL, or 600V, 90°C, UL Type MC-HL

Control:

300V, 105°C, UL Type ITC-HL, or 600V, 90°C, UL Type MC-HL

Gardex® is a UL-listed instrumentation cable that provides outstanding performance in process control applications which are subject to high current or voltage interference. It offers a variety of conductor combinations consisting of shielded or unshielded pairs, triads, and multiple conductors with or without overall shielding. Various insulation and jacketing materials are available to suit special requirements or standards. Gardex® cables may be installed in trays, ducts, or conduits, and may also be self-supported or direct-buried.

Construction

Conductor Types:	Annealed, Bare Copper, Class “B” Stranded, per ASTM B3 & B8 Annealed, Tinned Copper, Class “B” Stranded, per ASTM B3, B8, & B33
Insulation Types:	Instrumentation: PVC ⁱⁱ , PVC/Nylon, XLPE Control: PVC/Nylon ⁱ , XLPE
Color Code:	Instrumentation: ICEA Method 1, Table E1: Black & White (Pairs); Black, White, & Red (Triads), with Printed Number Control: ICEA Method 4, Table 3: Black & Numbered, ICEA Method 1, Table E2
Shielding:	Aluminum/Polyester Shield, with Drain Wire
Inner Jacket:	PVC, ARCTIC-GRADE PVC
Armor:	Gardex® Continuously-Corrugated, Welded Aluminum
Overall Jacket	PVC, ARCTIC-GRADE PVC, OIL RES PVC
Special Lengths:	Continuous lengths of up to 10,000 ft can be provided based on cable configuration. Please contact your Dekoron customer service representative with your specific needs.

Performance Standards

- UL-Listed, Type MCⁱ, per UL 1569, or Type PLTC/ITCⁱⁱ, per UL 13 & UL 2250, for use in Class I, Division 2 Hazardous Locations
- UL-Listed, Type ITC-HLⁱⁱ, or MC-HLⁱ, per UL 2225, for use in Class I, Division 1 Hazardous Locations
- UL-Approved and Marked for Cable Tray “CT” use
- UL-Approved and Marked with “FT-4/IEEE 1202” Flame Test Designation
- UL-Approved and Marked with “-40°C” Designation, per ULⁱⁱⁱ
- Cables Pass 70,000 BTU/hr Vertical Tray Flame Test, per UL 1581, UL 1685, ICEA, & IEEE 383

Note:

- ⁱ 600V Applications Only
- ⁱⁱ 300V Applications Only
- ⁱⁱⁱ XLPE Insulation & ARCTIC-GRADE Jacket Required



Custom Gardex® Cables

Dekoron offers a variety of custom cables that you can specify:

ITC-HL CAT5E OR 6 Ethernet Cables with Gardex® Armor:

These are industrial-type, ruggedized Cat5e Ethernet cables that use larger conductors. The Gardex® armor enables the cable to be used in Class I, Division 1 environments.

Fiber and Power Composite Cables:

We can combine power and fiber cables into one composite cable and apply a Gardex® armor.

Gardex® Instrumentation Cable – Specifications

Electrical Properties ⁱ	Units		Conductor Size - 300V				Conductor Size - 600V			
			18 AWG/0.8 mm ²		16 AWG/1.3 mm ²		18 AWG/0.8 mm ²		16 AWG/1.3 mm ²	
Resistance [R]	Ω/Mft	Ω/km	6.7	21.9	4.2	13.7	6.7	21.9	4.2	13.7
Mutual Capacitance										
Type 185W	pF/ft	pF/m	56	184	64	210	38	125	43	141
Type 187W	pF/ft	pF/m	56	184	64	210	38	125	43	141
Type 2X5W	pF/ft	pF/m	31	102	35	115	21	69	24	79
Type 2X7W	pF/ft	pF/m	31	102	35	115	21	69	24	79
L/R Ratio	μH/Ω		13		20		16		24	
Inductance [L]	μH/ft	μH/m	0.18	0.58	0.17	0.54	0.22	0.71	0.20	0.66

ⁱ Electrical Properties based on 7-Strand Bare Copper

Part Number–300V PLTC/ITC	Pairs	Nominal O.D.		Weight		Outer Jacket Thickness	
		in	mm	lb/ft	kg/m	mils	mm
Conductor Size: 18 AWG/0.8 mm²							
185W-8860R	1	0.500	12.7	0.134	0.199	50	1.27
187W-80280	2	0.680	17.3	0.228	0.339	50	1.27
187W-80480	4	0.800	20.3	0.313	0.466	50	1.27
187W-80880	8	0.940	23.9	0.434	0.646	50	1.27
187W-81280	12	1.170	29.7	0.606	0.902	50	1.27
187W-82480	24	1.430	36.3	0.947	1.409	50	1.27
Conductor Size: 16 AWG/1.3 mm²							
185W-6860R	1	0.540	13.7	0.155	0.231	50	1.27
187W-60280	2	0.760	19.3	0.283	0.421	50	1.27
187W-60480	4	0.880	22.4	0.377	0.561	50	1.27
187W-60880	8	1.120	28.4	0.586	0.872	50	1.27
187W-61280	12	1.230	31.2	0.730	1.086	50	1.27
187W-62480	24	1.680	42.7	1.296	1.929	60	1.52

Part Number–600V MC-HL	Pairs	Nominal O.D.		Weight		Outer Jacket Thickness	
		in	mm	lb/ft	kg/m	mils	mm
Conductor Size: 18 AWG/0.8 mm²							
2X5W-89610-200S1	1	0.640	16.3	0.182	0.271	50	1.27
2X7W-80260-200S1	2	0.840	21.3	0.290	0.431	50	1.27
2X7W-80460-200S1	4	0.980	24.9	0.387	0.576	50	1.27
2X7W-80860-200S1	8	1.230	31.2	0.555	0.827	50	1.27
2X7W-81260-200S1	12	1.360	34.5	0.692	1.030	50	1.27
2X7W-82460-200S2	24	1.920	48.8	1.264	1.881	60	1.52
Conductor Size: 16 AWG/1.3 mm²							
2X5W-69610-200S1	1	0.640	16.3	0.191	0.285	50	1.27
2X7W-60260-200S1	2	0.940	23.9	0.352	0.524	50	1.27
2X7W-60460-200S1	4	1.020	25.9	0.439	0.654	50	1.27
2X7W-60860-200S1	8	1.230	31.2	0.630	0.937	50	1.27
2X7W-61260-200S1	12	1.430	36.3	0.822	1.223	50	1.27
2X7W-62460-200S1	24	2.060	52.3	1.556	2.316	60	1.52

Gardex® Control Cable – Specifications

Electrical Properties ⁱ	Units		Conductor Size					
			14 AWG/2.1 mm ²		12 AWG/3.3 mm ²		10 AWG/5.3 mm ²	
Resistance [R]	Ω/Mft	Ω/km	2.6	8.6	1.7	5.4	1.0	3.4
Mutual Capacitance								
Type 2X3W	pF/ft	pF/m	13	43	14	46	15	49
L/R Ratio	μH/Ω		36		53		79	
Inductance [L]	μH/ft	μH/m	0.19	0.62	0.18	0.58	0.17	0.54

ⁱ Electrical Properties based on 7-Strand Bare Copper

Part Number–600V MC-HL	Conductors	Nominal O.D.		Weight		Outer Jacket Thickness	
		in	mm	lb/ft	kg/m	mils	mm
Conductor Size: 14 AWG/2.1 mm²							
2X3W-4036L-230GIMC	3	0.720	18.3	0.253	0.377	50	1.27
2X3W-4046L-230GIMC	4	0.760	19.3	0.284	0.423	50	1.27
2X3W-4056L-230GIMC	5	0.840	21.3	0.330	0.491	50	1.27
2X3W-4076L-230GIMC	7	0.940	23.9	0.405	0.603	50	1.27
2X3W-4096L-230GIMC	9	1.020	25.9	0.465	0.692	50	1.27
2X3W-4126L-230GIMCI	12	1.120	28.4	0.569	0.832	50	1.27
Conductor Size: 12 AWG/3.3 mm²							
2X3W-2036L-230GIMC	3	0.800	20.3	0.315	0.469	50	1.27
2X3W-2046L-230GIMCI	4	0.840	21.3	0.353	0.525	50	1.27
2X3W-2056L-230GIMCI	5	0.940	23.9	0.422	0.628	50	1.27
2X3W-2076L-230GIMCI	7	0.980	24.9	0.485	0.721	50	1.27
2X3W-2096L-230GIMCI	9	1.120	28.4	0.588	0.874	50	1.27
2X3W-2126L-230GIMC	12	1.230	31.2	0.699	1.041	50	1.27
Conductor Size: 10 AWG/5.3 mm²							
2X3W-1036L-230GIMC	3	0.880	22.4	0.400	0.595	50	1.27
2X3W-1046L-230GIMCI	4	0.940	23.9	0.456	0.678	50	1.27
2X3W-1056L-230GIMC	5	1.020	25.9	0.526	0.782	50	1.27
2X3W-1076L-230GIMC	7	1.065	27.1	0.619	0.921	50	1.27
2X3W-1096L-230GIMC	9	1.230	31.2	0.748	1.113	50	1.27
2X3W-1126L-230GIMC	12	1.300	33.0	0.888	1.322	50	1.27

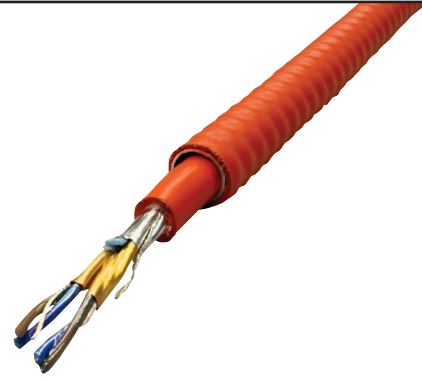


Gardex® Fieldbus

300V, 105°C, UL Type PLTC/ITC & ITC-HL

600V, 90°C, UL Type MC-HL

Gardex® Fieldbus cables are UL-listed and FIELDCOMM GROUP registered digital data cables conforming to FF-844 or ISA protocol. Gardex® offers shielded pairs with overall shielding in numerous pair counts. Various jacketing materials are available to suit special requirements or standards. Gardex® cables may be installed in trays, ducts, or conduits, and may also be self-supported or direct-buried.



Construction

Conductor Types	18 or 16 AWG, Annealed, Tinned Copper, Class “B” Stranded, per ASTM B3, B8 & B33 18 or 16 AWG, Annealed, Bare Copper, Class “B” Stranded, per ASTM B3 & B8 ^{vii}
Insulation	XLPE
Circuit Identification & Color Codes	Brown & Blue (FIELDCOMM STD), Orange & Blue Black & White, White Numbered Custom Color Codes ^{vii}
Shielding	Aluminum/Polyester Shield, with Drain Wire
Shielded Pair Jacket^{viii}	Flame-Retardant, PVC, Black Flame-Retardant, Arctic-Grade PVC, Black Special Colors ^{vii}
Inner Jacket	Flame-Retardant, PVC, Orange (FIELDCOMM STD.) Flame-Retardant, Arctic-Grade PVC, Black ^{vii}
Armor	Gardex® Continuously-Corrugated, Welded Aluminum
Outer Jacket	Flame-Retardant, PVC, Orange (FIELDCOMM STD.) Flame-Retardant, Arctic-Grade PVC, Black ^{vii} Special Colors ^{vii}

Performance Standards

Note:

ⁱ 600V Applications Only

ⁱⁱ 300V Applications Only

ⁱⁱⁱ XLPE Insulation & Arctic-Grade Jacket Required

^{iv} 600V Applications Only, Green Ground Required

^v Insulation at -70°C, Jacket at -51°C

^{vi} Tinned Copper Conductor Required

^{vii} Available by Request Only

- UL Listed, Type MCⁱ, per UL 1569, or Type PLTC/ITCⁱⁱ, per UL 13 & UL 2250, for use in Class I, Division 2 Hazardous Locations
- UL Listed, Type ITC-HLⁱⁱ, or MC-HLⁱ, per UL 2225, for use in Class I, Division 1 Hazardous Locations
- UL-Approved and Marked for Cable Tray “CT” Use
- UL-Approved and Marked with “FT-4/IEEE 1202” Flame Test Designation
- UL-Approved and Marked with “-40°C” Designation, per ULⁱⁱⁱ
- Cables Pass 70,000 BTU/hr Vertical Tray Flame Test, per UL 1581, UL 1685, ICEA, & IEEE 383
- CUL-Listed as CEC Type ACIC in accordance with CSA Standard C22.2 No. 239^{iv}
- Passes ASTM D746-04 Brittleness Temperature Impact Test at -75°C^v
- Meets Fieldbus Foundation FF-844 Specifications, Marked as “Type A HI Fieldbus Cable”^{vi}
- Meets ISA 50.02 Part 2 Fieldbus Standard, for Use in Industrial Control Systems
- Meets IEC 61158-2 Requirements for Industrial Fieldbus Cable

Gardex® Fieldbus Cable – Specifications

Electrical Properties ⁱ	Units		Conductor Size - 300V				Conductor Size - 600V			
			18 AWG/0.8 mm ²		16 AWG/1.3 mm ²		18 AWG/0.8 mm ²		16 AWG/1.3 mm ²	
Resistance [R]	Ω/Mft	Ω/km	6.9	22.7	4.4	14.3	6.9	22.7	4.4	14.3
Mutual Capacitance										
Type FB5W	pF/ft	pF/m	23	75	24	79	21	69	22	72
Type FB7W	pF/ft	pF/m	23	75	24	79	21	69	22	72
L/R Ratio	μH/Ω		15		23		16		24	
Inductance [L]	μH/ft	μH/m	0.20	0.67	0.20	0.66	0.22	0.71	0.21	0.69

ⁱ Electrical Properties based on 7-Strand Bare Copper

Part Number–300V PLTC/ITC	Pairs	Nominal O.D.		Weight		Outer Jacket Thickness		
		in	mm	lb/ft	kg/m	mils	mm	
Conductor Size: 18 AWG/0.8 mm²								
FB5W-8831A-274	1	0.580	14.7	0.163	0.242	50	1.27	
FB7W-80230-374	2	0.800	20.3	0.275	0.411	50	1.27	
FB7W-80430-374	4	0.940	23.9	0.370	0.550	50	1.27	
FB7W-80830-374	8	1.170	29.7	0.544	0.810	50	1.27	
FB7W-81230-374	12	1.300	33.0	0.696	1.035	50	1.27	
FB7W-82430-374	24	1.830	46.5	1.236	1.839	60	1.52	
Conductor Size: 16 AWG/1.3 mm²								
FB5W-6861A-274	1	0.640	16.3	0.191	0.285	50	1.27	
FB7W-60260-374	2	0.940	23.9	0.350	0.521	50	1.27	
FB7W-60460-374	4	1.065	27.1	0.470	0.699	50	1.27	
FB7W-60860-374	8	1.300	33.0	0.678	1.009	50	1.27	
FB7W-61260-374	12	1.560	39.6	0.911	1.355	50	1.27	
FB7W-62460-374	24	2.140	54.4	1.694	2.521	60	1.52	

Part Number–600V MC-HL	Pairs	Nominal O.D.		Weight		Outer Jacket Thickness		
		in	mm	lb/ft	kg/m	mils	mm	
Conductor Size: 18 AWG/0.8 mm²								
FB5W-88610-274MC	1	0.640	16.3	0.181	0.269	50	1.27	
FB7W-80260-374MC	2	0.840	21.3	0.288	0.429	50	1.27	
FB7W-80460-374MC	4	0.980	24.9	0.385	0.572	50	1.27	
FB7W-80860-374MC	8	1.230	31.2	0.553	0.823	50	1.27	
FB7W-81260-374MC	12	1.360	34.5	0.689	1.026	50	1.27	
FB7W-82460-374MC	24	1.920	48.8	1.259	1.874	60	1.52	
Conductor Size: 16 AWG/1.3 mm²								
FB5W-68710-274MC	1	0.640	16.3	0.192	0.286	50	1.27	
FB7W-60270-374MC	2	0.940	23.9	0.352	0.524	50	1.27	
FB7W-60470-374MC	4	1.120	28.4	0.483	0.719	50	1.27	
FB7W-60870-374MC	8	1.300	33.0	0.664	0.988	50	1.27	
FB7W-61270-374MC	12	1.560	39.6	0.886	1.318	50	1.27	
FB7W-62470-374MC	24	2.140	54.4	1.622	2.414	60	1.52	

Packaging & Documentation

If requested prior to ordering, Dekoron can provide Certificates & Test Reports (Certificates of Conformance) for every item on an order shipment.

Custom reel tags can be printed to meet customer requirements if they are requested prior to placing an order.

Unless otherwise specified, cables are delivered on wooden reels from 16 up to 96 inches in diameter. On most reels, there is an option to add lagging (wooden planks nailed to the reels flanges) to prevent damage to the cable while in transit. Dekoron's wooden reels are heat-treated and comply with international phytosanitary requirements.

Cable ends are left exposed on the outside of the reel to allow for final testing. They are sealed with heat-shrink caps during shipment.

CHEMICAL RESISTANCE GUIDE

CHEMICAL	Chlorinated Polyethylene (CPE)	High Density Polyethylene (HDPE)	Low Density Polyethylene (LDPE)	Polyvinylchloride (PVC)
Sodium Chloride 10%	E	E	E	E
Ammonium Hydroxide 10%	E	E	E	E
Hydrochloric Acid 10%	E	E	E	E
Sodium Hydroxide 10%	E	E	E	E
Acetic Acid 5%	E	E	E	E
Sulfuric Acid 30%	E	E	E	G
Nitric Acid 10%	E	E	E	G
Naphtha	E	G	G	G
Methanol	E	G	P	G
Diesel / Gasoline	E	G	P	P
Acetone	E	G	P	D
Kerosene	E	G	P	E
Cyclohexane	G	G	P	P
Benzene	G	P	P	P
Toluene	G	P	P	P
Carbon Tetrachloride	G	P	P	P

E	Excellent	Retains >80% original ultimate tensils and >80% original elongation and has <50% volume swell.
G	Good	Retains 60-80% original ultimate tensils or 60-80% original elongation or has 50-100% volume swell.
P	Poor	Retains <60% original ultimate tensile or <60% original elongation or has >100% volume swell.
D	Deteriorated	No properties could be recorded, compound deteriorated.

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A Marmon Wire & Cable/Berkshire Hathaway Company